

Spring River Watershed Summit

A Municipal Perspective
May 30, 2013

Presentation by:
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Municipal Infrastructure Wastewater Collection Piping



Municipal Infrastructure Wastewater Treatment





Municipal Infrastructure Water Distribution





A look through municipally-colored glasses

- Urban Dwellers & Demographics
- Utility Rates
- A Forward-looking View of Municipal Infrastructure in the Spring River Watershed



A look through municipally-colored glasses

- **Urban Dwellers & Demographics**
- Utility Rates
- A Forward-looking View of Municipal Infrastructure in the Spring River Watershed

Missouri



- 68,886 = Land area in square miles
- 5,998,900 = Population (2010 U.S. Census)
- 970 = Number of communities
- 654 = Number of cities
- 623 = Number of communities with less than 1,000 people
- 4th = U.S. rank of number of smaller communities
 - (less than 1,000 people)
- 13 = Number of municipalities greater than 50,000 people
- \$45,229 = State's median household income

Spring River Watershed



- 2,271 = Land area (miles²)
- 182 = Land area occupied by “urban” users (miles²)
- 137 = Number of communities
 - Includes: Villages, Towns, & Cities
- 8% of land use is “urban”.

Spring River Watershed



- 2,271 = Land area (miles²)
- 137 = Number of communities
- 119 = Number of communities with less than 1,000 people
- 14 = Number of communities with 1,000 to 10,000 people
- 3 = Number of communities with 10,000 to 50,000 people
- 1 = Number of communities greater than 50,000 people

Spring River Watershed



- 2,271 = Land area (miles²)
- 145,600 = Population (2010 U.S. Census)
- 118 = Land area occupied by “city” dwellers (miles²)
- 5.2% = Land area occupied by “city” dwellers

- 56 = Number of cities
- 38 = Number of cities with less than 1,000 people
- 14 = Number of cities with 1,000 to 10,000 people
- 3 = Number of cities with 10,000 to 50,000 people
- 1 = Number of cities greater than 50,000 people

Villages & Towns & Cities



There are 81 Villages & Towns in the watershed.

- Two of them (Freistatt & Wentworth) have their own sewer treatment facility.

There are also 56 Cities in the watershed ranging from 207 people (Asbury, Jasper County) to 50,100 people (Joplin, Jasper & Newton Counties).

- Of the 56 cities, 30 have their own permitted wastewater facility and 7 discharge to a jointly-owned or -operated facility (City of Joplin has two facilities).



A look through municipally-colored glasses

- Urban Dwellers & Demographics
- **Utility Rates**
- A Forward-looking View of Municipal Infrastructure in the Spring River Watershed

Missouri's 2012 Rate Survey Results

Community Size Grouping (Population)	Number of Communities in Size Group	Surveyed Communities in Size Group	Water Rates (as % of MHI)	Sewer Rates (as % of MHI)
100 - 999	493	320	1.29%	0.94%
1,000 - 3,500	178	176	1.08%	0.94%
3,501 - 5,999	55	52	0.87%	0.84%
6,000 - 9,999	36	36	0.81%	0.72%
10,000 - 49,999	65	64	0.72%	0.70%
Larger than 50,000	13	13	0.69%	0.76%

Watershed's 2012 Rate Survey Results

Cities Size Grouping (Population)	Number of Cities in Size Group	Surveyed Cities in Size Group	Water Rates (as % of MHI)	Sewer Rates (as % of MHI)
100 - 999	17	17	0.96%	1.00%
1,000 - 3,500	9	9	0.89%	1.17%
3,501 - 5,999	2	2	0.67%	0.82%
6,000 - 9,999	3	3	0.70%	0.61%
10,000 - 49,999	3	3	0.94%	0.91%
Larger than 50,000	1	1	1.16%	0.73%

A Comparison of 2012 Rate Survey Results

Cities Size Grouping (Population)	Number of Cities in Size Group	Surveyed Cities in Size Group	Water Rates (as % of MHI)	Sewer Rates (as % of MHI)
100 - 999	17	17	- 0.33%	0.06%
1,000 - 3,500	9	9	- 0.19%	0.23%
3,501 - 5,999	2	2	- 0.20%	0.02%
6,000 - 9,999	3	3	- 0.11%	- 0.11%
10,000 - 49,999	3	3	0.22%	0.21%
Larger than 50,000	1	1	0.47%	- 0.03%



A Forward-looking view of the Spring River Watershed shows that we have opportunities to gather and “mine” municipal infrastructure data.

Here are just a few examples.

Gaps in the Watershed Data from a Municipal Perspective



Opportunities to Gather Watershed **Potable Water** Data

- How many assets are there?
- What is the production cost of potable water?
- What are the total energy costs to pump & produce water?
- What is the potable water loss?
- What is the water meter age & coverage?
- What is the water main age & condition?
- What is the main break frequency? Why?

Gaps in the Watershed Data from a Municipal Perspective



Opportunities to Gather Watershed **Potable Water** Data

- **How many assets are there?**
- What is the production cost of potable water?
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Gaps in the Watershed Data from a Municipal Perspective



Opportunities to Gather Watershed **Potable Water** Data

By the question: “How many assets are there?” I mean...

- How many miles of pipe are there in the watershed?
What type is it? How many fire hydrants are there? How many water meters are there? Are there SCADA systems? If not, why not? What about asset GPS locations? What is the condition of everything?
- And is any of this data query-able and sort-able?

Gaps in the Watershed Data from a Municipal Perspective



Opportunities to Gather Watershed **Potable Water** Data

The question: “What is the potable water loss?” means...

- Does the utility compute water loss? If not, why not? How many utilities compute water loss yearly or monthly? What is the percentage? What are the utilities doing to reduce the losses? How many have yearly leak detection programs?

Gaps in the Watershed Data from a Municipal Perspective



Opportunities to Gather Watershed **Potable Water** Data

The question: “What is the potable water loss?” means...

- The Tri-State Water Resources Coalition’s & U.S. Army Corps of Engineers’ model uses a water loss that is capped at 14%. Is this realistic?
- Should we be satisfied that less than 50% of the data requests were honored?
- Should we be satisfied that 74% of the population served by the entities returned the questionnaire?

Gaps in the Watershed Data from a Municipal Perspective



Opportunities to Gather Watershed **Potable Water** Data

The question: “What is the potable water loss?” means...

- The Tri-State Water Resources Coalition’s & U.S. Army Corps of Engineers’ model uses a water loss that is capped at 14%. Is this realistic? **Perhaps**
- Should we be satisfied that less than 50% of the data requests were honored? **NO**
- Should we be satisfied that 74% of the population served by the entities returned the questionnaire? **NO**

Gaps in the Watershed Data from a Municipal Perspective



Opportunities to Gather Watershed **Wastewater** Data

- What is the production cost of treated effluent?
- What are the total energy costs to treat?
- What is the inflow / infiltration values?
- What is the collection main age & condition?
- At what size of storm event do the utilities experience sanitary sewer overflows or bypasses? Why?



As a boots-on-the-ground,
municipal utility guy,
those are the items I consider
when hear “Watershed
Management”...

But what do others think it
means?



Department of Natural Resources

Director Sara Parker Pauley





I Think What I Heard Was...



...the Director said: We fixed what we could
see in the 1970s and early 1980s, but now
we have more to fix.

“But Sara...Where are the burning rivers?
I don’t see them”.

Didn’t we fix everything already?



A Nation in Need



- In 2009, the American Society of Civil Engineers (ASCE) gave water and wastewater infrastructure a grade of “D-” nationwide.
- In 2013, they rank our infrastructure condition...up...to a “D”.



A Nation in Need

Drinking Water Assessment



- **\$334B** (between 2007 & 2027)
 - USEPA 2007 Needs Survey [assumes no population growth].
 - **\$44B** is Missouri's share of the need.
- **\$1.02T** (between 2011 and 2035)
 - AWWA's "Buried No Longer" [Water Mains Only!] [Includes \$526M for replacement and \$498B for population growth].
 - Midwestern need includes **\$147B** for replacement and **\$25B** for growth].
- **\$1.73T** (between 2011 and 2050)
 - AWWA: Midwestern need includes **\$224B** for replacement and **\$37B** for growth].

A Nation in Need

Wastewater Assessment



- \$298.1 Billion (from 2008 to 2028)
 - USEPA 2010 Needs Survey Report [using 2008 data].
 - **\$5.19B** Missouri's share.
 - Missouri ranked 14th worst overall.
 - Missouri ranked worst in the nation (i.e., most needy) in inflow / infiltration correction, with **\$1.25B** in need.

Missouri Need Wastewater Assessment



- **\$5.19 Billion (from 2008 to 2028)** [using 2008 data].
 - Our State = \$1.25B for I/I correction (most needy State).

But:

- Values were published before the Federal Orders for St. Louis MSD (**\$4.7B** by 2023) & Kansas City (**\$2.5B** by 2035).
- Compliance with the proposed Water Quality Standards Rule is **\$1.2B** (compliance issues will begin in 2014).
- Smaller systems (less than 10,000 people) not robustly surveyed in 2008 USEPA Needs Survey.
- **Values are much, much higher now...quickly approaching...
\$15B!**



Spring River Watershed Wastewater Needs Assessment



- In July 2011, Missouri Association of Councils of Governments made a Statewide Assessment of Wastewater Needs (commonly referred to as the 604(b) Report) for smaller communities (5,000 people and fewer).
- The 604(b) Report states that:
- 7 of 14 communities with I/I issues **did not** have an plan.
- 3 of the 7 communities have piping in “poor” condition.
- 3 had Notices of Violation.
- 13 communities have schedules of compliance.



How are we (the municipalities) going to resolve the “still have a long way to go” issues that Director Pauley is talking about?



A Forward-looking view of Infrastructure Improvement in the Spring River Watershed (in Football terminology)

- 1) Don't commit turnovers.
- 2) Run the ball.
- 3) Play great defense.



The Forward-looking View of Infrastructure Improvements

- 1) Do not let “a failure” in one utility’s infrastructure effect another.
- 2) Put the potable water back in the distribution piping.
- 3) Keep the rainwater out of the sewer collection piping.



A Return to Infrastructure Fundamentals

~~A Forward-looking View~~

- 1) Do not let “a failure” in one utility’s infrastructure effect another.
- 2) Put the potable water back in the distribution piping.
- 3) Keep the rainwater out of the sewer collection piping.



A Solution for the Watershed



The next set of environmental problems are not going to be solved by fixing only what we can **see**.

The Spring River is not on fire.



Our Path Forward



Just add the letter “k**” to what
Director Pauley said in her video.**



Our Path Forward



**Make the paradigm shift from
seeing to seek^{ing}.**



A Solution for the Watershed



The next set of environmental problems are ones that we will have to **seek**. After we have found them, we will have to prioritize which ones have the most detrimental impact on the watershed, prioritize those, and then fix the ones that show the most benefit for the cost.



A Solution for the Watershed

The next set of environmental problems move from place-to-place; are seldom re-occurring, and can be illusive.

Without the willingness to **seek them out**, they will go un-solved.

A Solution for the Watershed



How to **seek**.

A Solution for the Watershed





A Solution for the Watershed

How to **seek.**

Oh...I noticed that you have so quickly forgotten.

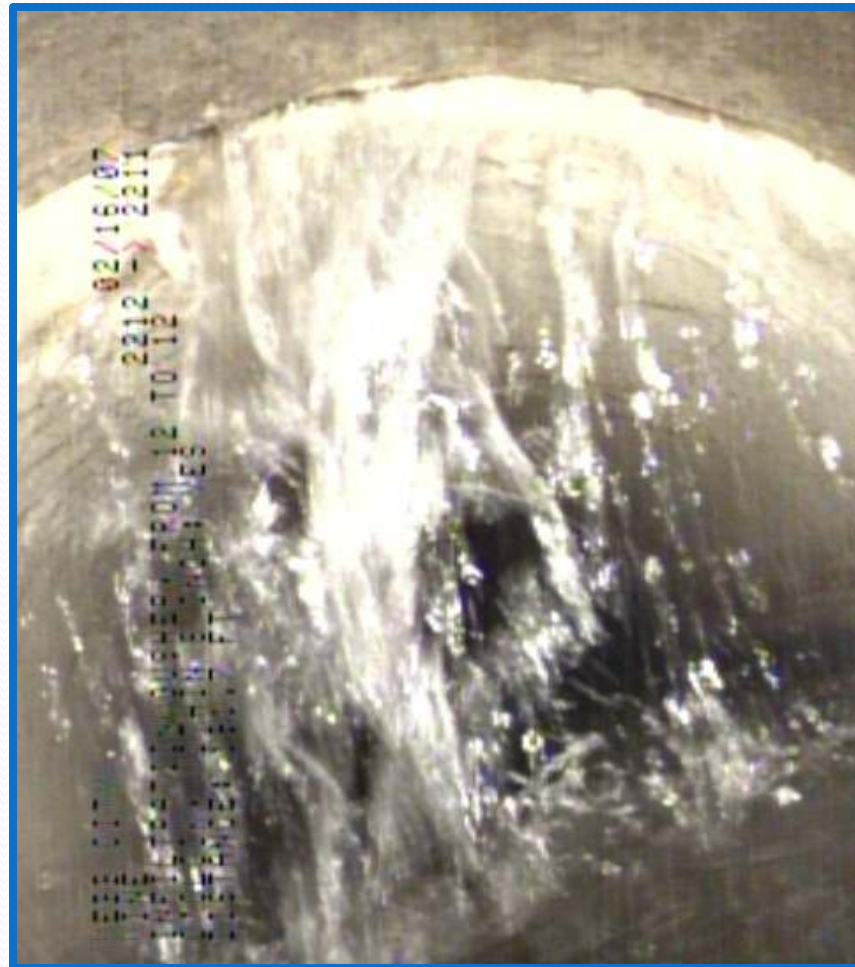
Remember its all about the Fundamentals!



A Return to Infrastructure Fundamentals

- 1) Do not let “a failure” in one utility’s infrastructure effect another.
- 2) Preventable water block in the distribution piping.
- 3) Keep the rainwater out of the sewer collection piping.

Do not let a “failure” in one utility department effect another.



Webb City

NE corner of Vine & Penn Intersection

Note that the potable water leak from this water main did not surface.

Water Leak

Sewer Infiltration

(As seen in the previous still picture).



Can you see the water leak?



Can you see it now?





Active and Annual **Seeking** of Water Losses





Seek to Minimize Revenue Leaks





Let's see a Sanitary Sewer Overflow (SSO) in the Spring River Watershed

This SSO is the result of a 2.38 inch rainfall
event that occurred on Friday & Saturday,
April 26 & 27, 2013.

(viewed on 4/27/13)







Let's see the aftermath of another Sanitary Sewer Overflow (SSO) in the Spring River Watershed


This SSO is the result of a 1.43 inch rainfall event that occurred on Thursday, April 18, 2013.

(viewed on Monday 4/22/13)





Do you remember this? It may have arrived on 4/18/13. It has been on the ground for 4 days.

A photograph of a stream flowing over rocks, creating white water. The stream is surrounded by green grass and some trees in the background. A small white object is circled in red in the upper left portion of the stream. The image is framed by a black border.

Do you remember
this now?

So nine days later...
it's still there.

Do you see
what I see?







When was this lid displaced?



Legacy Issues

Adverse Water Quality Impacts in the Spring River Watershed

Do you see the
infrastructure?



Do you see the
infrastructure now?





How about now?

There it is !
Hey... what's this?





A Legacy of SSOs?



Before you think that the municipal
infrastructure “legends” are immune from
public scrutiny...

Please remember that we are in a New Age
of Information and Data Sharing...

!@#\$% goes “Viral” in a hurry!

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[Bardstown Kentucky City Council...](#)

92 views | 1 year ago



About thebrum40004's chan

by thebrum40004

Date Joined

Country

Bardstown, Kentucky



Named:
2012's Most
Beautiful
Small Town
in America

by Rand McNally & U.S. Today

“Bourbon
Capital of
the World”



As a boots-on-the-ground,
municipal utility guy...



Watershed Management is about:

Raising the competence and performance
of the under-achievers. It is not raising the
“bar” for the good performers.



Watershed Management is about:

Raising the competence and performance of the under-achievers. It is not raising the “bar” for the good performers.

Why Not?



Watershed Management is about:

Raising the competence and performance of the under-achievers. It is not raising the “bar” for the good performers.

Watershed improvements are more dramatic and cheaper when the under-achiever’s performance improves.



“Mining” data from “Under-performers” Spring River Watershed Focus

How many utilities have sanitary sewer overflows through manholes in a 0.5-inch rainstorm? Where are they? What about for 1.0-inch storms? Why do they occur?

Historically, we know that a 1-day, 1.6-inch storm has a 2-month reoccurrence interval.



Watershed Management is also about:

Local folks who care about their local watershed, with sufficient determination, that they become the community leaders who decide to **seek** out the remaining environmental problems and “tackle” them.

Thank You for Your Attention!

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